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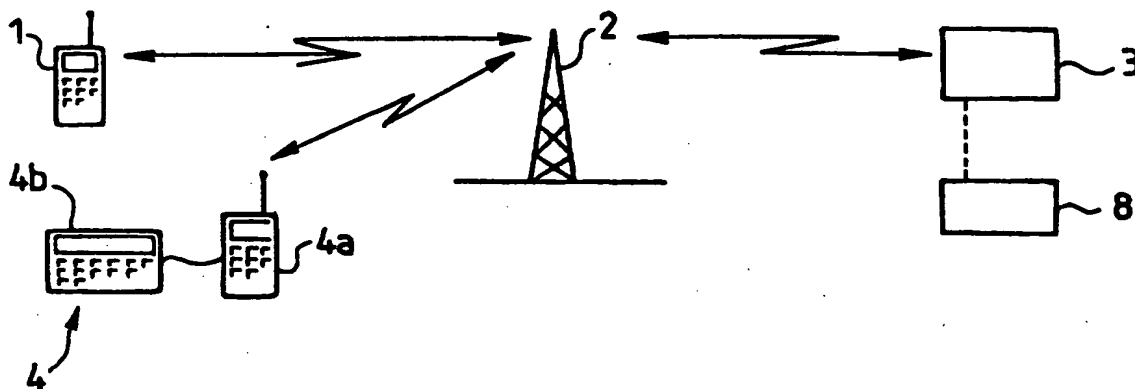


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(54) Title: SYSTEM AND METHOD FOR PAYING PARKING FEES



(57) Abstract

The invention relates to a system and a method for paying parking fees. The system of the invention is a service of a mobile telephone system to which users of the service have access by telephone. Parking accounts are opened at a service unit (3; 8) of the mobile telephone system for users of the service, in which account is kept of the parkings communicated by the user, and that the system further comprises controlling means (4) of said parking accounts operating in real time by which means the data on parking communicated by a phone (1) is controllable.

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System and method for paying parking fees

5 The present invention relates to a system and a method for paying parking fees and for controlling the payment of parking fees, in which the parking fee system is a service of a mobile telephone system.

10 Today such parking systems are developed where a conventional automatic parking fee machine found in the street or at the gate of a car park can be replaced by a car-specific device, for which parking time is bought in advance and loaded into the device. The systems are generally based on function cards or smart cards having a processor or a memory of their own, paid parking time being recurrently loadable into the card at a point of distribution of parking time, e.g. at a service station, by paying the necessary fee in advance. After that, parking time is loaded from the card into a car-specific parking meter device by transferring the desired parking time from the function card to the parking fee device by means of the function keys of the parking meter device. The display of the parking fee device disposed e.g. on the dashboard of a vehicle shows the time loaded thereinto to a passing traffic warden.

25 For example, Finnish Published Specification 89,753 discloses a car-specific parking-meter which loaded with parking time is controlled by transmitting a control command to the parking meter device by wireless data transmission. The device described in Finnish Published Specification 89,753 operates acceptably as a meter and an indicator of paid parking time. A drawback of said system is that a motorist has to buy an expensive device, or a parking meter just for parking, and that the system requires that a function card be bought and/or loaded in advance at a point of

30

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distribution of parking time.

When in a strange part of town, or in a strange town or even in a foreign country in which the motorist has no knowledge of the operation of the sales network of parking-meter devices, the payment of parking may be difficult. In addition, the time of the day can be such that the points of distribution are closed but a parking fee should still be paid.

The object of this invention is to achieve such a parking fee system that does not have the above-mentioned drawbacks. The system of the invention, in which users of the service have access to a service unit of the parking fee system by telephone for paying the parking fee by communicating a user-specific identity code and/or a car registration number and a code of the car park, is characterized in that a parking account is opened at the service unit of the system for each user of the service, in which account is kept of the parkings communicated thereto by the user, and that the system further comprises controlling means of the parking account by which means the data on parking is controllable by telephone from the service unit of the parking fee system.

In the invention, a chargeable parking system is achieved which does not require any additions to the present infrastructure nor any car-specific parking-fee devices or meters. The system can be readily implemented in parallel with other ways of paying the parking fee and the service operator can be a mobile telephone network operator or any company which makes an agreement with an operator to use the network and to implement the required parking accounts. An essential part of the invention is that it is easy to control the parked vehicles, which can also be done without any great investments or changes in the present

infrastructure.

The other advantageous embodiments of the invention and the method of the invention are characterized by what is disclosed below in the appended
5 claims.

In the following, the invention will be explained by way of example with reference to the attached drawings, in which

Figure 1 shows a general view of parking
10 taking place in accordance with the invention,

Figure 2 shows a general view of the system of the invention,

Figure 3 shows some embodiments of the system of the invention,

15 Figure 4 shows a controllable parking account used in the invention.

Figure 1 illustrates a method accomplished in accordance with the invention for paying the parking fee. The invention relates to the mobile telephone
20 system so that the service accomplished by means of the invention is enabled by a mobile phone 1. This is achieved in the same way as any supplementary service, such as call transfer etc., is enabled, by entering a predetermined code to the phone which will forward it
25 to the service unit of the mobile telephone network. After that, the identification data of the parking car, such as the registration number, the code (XYZ) of the car park P and the starting time of parking is communicated by the mobile phone to the service unit
30 which registers the starting time of parking for the user of the service in question. Car parks of different tariff zones can, for example, be distinguished by means of codes of the car park. Information e.g. on the longest permitted parking time and other such
35 restrictions can also be included in the code. In order

to make the work of traffic wardens easier, the cars belonging to the system of the invention could carry a sticker T on the windscreen.

5 Figure 2 shows parts of the mobile telephone system. The mobile phone 1 communicates in a normal manner on the radio path with a base station 2 which further communicates either on the radio path or by a fixed cabling with a mobile telephone switching centre 3. According to one embodiment of the invention, the
10 mobile telephone switching centre 3 comprises parking accounts opened for users of the parking service in which account is kept of the parkings communicated thereto by the users. The mobile services switching centre is often referred to by the abbreviation MSC.

15 The system of the invention also comprises a controlling means 4 of parking accounts, shown in Figure 2, by which means the data on parking communicated by the mobile phone and the parking time used by the car can be controlled from the mobile
20 services switching centre 3. The controlling naturally takes place in real time. The controlling means 4 preferably comprise a mobile phone 4a and a computer or
25 another terminal 4b connected thereto by means of which a connection to the mobile services switching centre 3 or to a corresponding service unit can be established, for example, by dialling a certain number. It is obvious to one skilled in the art how the mobile phone 4a and the portable computer 4b can be made to co-operate in order to achieve wireless data transmission.

30 Alternatively, the controlling means could comprise a computer 4b or another terminal connected to a paging network and via the paging network to the service unit 3 of the mobile services switching centre and by means of which the data on parking can be
35 presented to a controlling person. The paging system

can for example maintain a database of the parked vehicles in the computer 4b, whereby the parking situation of each car can be controlled directly from the computer without separately contacting the service unit which maintains the parking accounts.

In another embodiment of the invention, the service unit containing the parking accounts of the mobile services switching centre is part of a service centre 5 which controls the operations of the network, as is shown in Figure 3. For example, in the GSM network this service centre of the mobile telephone network can comprise the network's own service centre (in the GSM network SC, i.e. Service Center), a short message centre of the network transmitting short messages (in the GSM network SMS, i.e. Short Message Service), or any such register that is connected to a fixed signalling channel of the mobile telephone network and to the users' mobile phones in cars 7 via a radio network 6.

In another embodiment of the invention, the service unit comprising the parking accounts of the mobile phone system can also be a register separate from the mobile services switching centre to which register a service number of the mobile telephone system only provides an access channel by calling a telephone number of the mobile services switching centre. This situation is shown in Figure 2 in which the mobile services switching centre 3 transmits a call to a database 8 containing the parking accounts of the parking service operator.

Figure 4 shows an example of a record of the parking account to be controlled. The secret PIN or the like code of the subscriber of the service is in field 9, the car registration number in field 10, the starting time of parking in field 11 and in field 12

the code XYZ of the car park shown in Figure 1. Parking is activated by supplying the PIN number and the code of the car park. The car registration number may be known to the system in advance (connected to the PIN code) and the system itself naturally knows the time.

If the PIN code of the user of the parking service is encoded into a function card which activates the phone, such as to the SIM card (Subscriber Identification Module) of the GSM system, or it is the same as the code of the card, any phone within the system can be used for parking which is connected to the digital mobile telephone network, such as the GSM network, and which can read the card, also e.g. a phone in the car park. The code in the SIM card is transmitted to a service unit 3; 5; 8 of the parking fee system from which the code can be controlled by the second GSM phone 4a and the terminal 4b possibly connected thereto which are included in the controlling means of the parking account.

The parking charge cumulated to a user need not be controllable but instead, after each parking the data record of Figure 4 is set to zero and the produced parking charge is added to the charging account of the user. The charging can be done separately or in connection with the charging of telephone calls. As the parking system is based on credit, a credit limit can be attached to the parking account which will stop chargeable parking from being continued and/or will generate an invoice to be sent to the user of the service. In fact, the possible fining for exceeding the maximum parking time, the credit limit or other errors can be arranged to be charged in a normal invoice since all the requisite information is already there; the place, the time and the registration number.

It is obvious to one skilled in the art that

the different embodiments of the invention are not restricted to the above example, but they may vary within the scope of the appended claims.

Claims

1. A system for paying parking fees and for
controlling the payment of parking fees, in which the
5 parking fee system is a service of a mobile telephone
system so that users of the service have access to a
service unit (3; 5; 8) of the parking fee system by
telephone for paying the parking fee by communicating
a user-specific identity code and/or a car registration
10 number (10) and a code (XYZ) of a car park (12),
c h a r a c t e r i z e d in that a parking account is
opened at the service unit of the system for each user
of the service, in which account is kept of the
parkings communicated thereto by the user, and that the
15 system further comprises controlling means (4) of the
parking account by which means the data on parking is
controllable by telephone from the service unit (3; 5;
8) of the parking fee system.

2. A system according to claim 1, c h a r a c -
20 t e r i z e d in that the controlling means (4)
comprise a phone (4a) of the mobile telephone system by
means of which the data on parking can be presented to
a controlling person.

3. A system according to claim 1, c h a r a c -
25 t e r i z e d in that the controlling means (4)
comprise a phone (4a) of the mobile telephone system
and a computer or another terminal (4b) connected
thereto by means of which the data on parking can be
presented to a controlling person.

4. A system according to claim 1, 2 or 3,
30 c h a r a c t e r i z e d in that the communication
between the controlling means (4) and the service unit
(3; 5; 8) of the parking fee system is arranged to take
place via a short message service of a mobile telephone
35 network (6).

5. A system according to any of claims 1 to 4, characterized in that the users of the parking fee system have in use a phone (1) connected to a digital mobile telephone network for communicating the data on parking, which phone can be activated by a function card containing a user-specific identification code which is transmitted to the service unit (3; 5; 8) of the parking fee system so that the code is controllable therefrom by the controlling means (4a; 4b) of the parking account.

6. A system according to any of claims 1 to 5, characterized in that the service unit of the mobile telephone system containing the parking accounts is part of the mobile services switching centre (3) which transmits calls of the network.

7. A system according to any of claims 1 to 5, characterized in that the service unit of the mobile telephone system containing the parking accounts is part of the short message centre (5) which transmits short messages of the network.

8. A system according to any of claims 1 to 5, characterized in that the service unit of the mobile telephone system containing the parking accounts is a separate register (5) which is connected to a signalling channel of the mobile telephone network (6).

9. A system according to any of claims 1 to 5, characterized in that the service unit of the mobile telephone system containing the parking accounts is a separate register (8) which can be indicated by calling a telephone number of the mobile telephone network.

10. A method for paying parking fees and for controlling the payment of parking fees, in which method the identity code of the user of the parking car

and/or the car registration number (10) and the code (XYZ) of the car park (12) and the starting time of parking are communicated by phone (1) to the service unit (3; 5; 8) of the parking fee system, c h a r a c-
5 t e r i z e d in that a parking account is opened at the service unit of the system for the users of the service in question, in which account is kept of the parkings communicated thereto by each user, and the data on parking is controlled by phone from said
10 parking account by means of controlling means (4).

11. A method according to claim 10, c h a r a c t e r i z e d in that the controlling is performed with the controlling means (4) by establishing a connection from the mobile phone (4a) to the service
15 unit (3; 5; 8) of the mobile telephone network, whereby the data on parking is presented to the controlling person by the mobile phone (4a) or by a computer or the like terminal (4b) connected thereto. O B S

12. A method according to claim 10 or 11, c h a r a c t e r i z e d in that the communication between the controlling means (4) and the service unit (3; 5; 8) of the parking fee system is arranged to take place via a short message service of the mobile
20 telephone network.

13. A method according to any of claims 10 to 12, c h a r a c t e r i z e d in that the data on parking is communicated by a phone (1) connected to a digital mobile telephone network, which phone is activated by a function card containing a user-specific
25 identification code which is transmitted to the service unit (3; 5; 8) of the parking fee system so that the code is controllable therefrom by the controlling means (4a; 4b) of the parking account.
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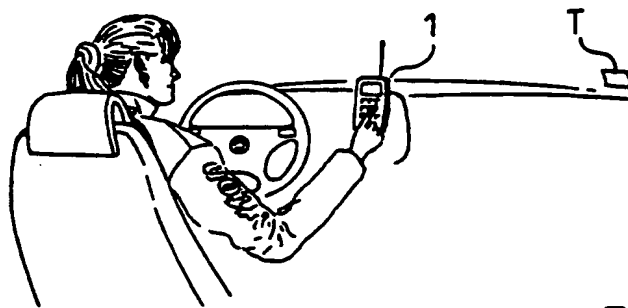
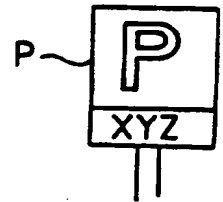


FIG. 1

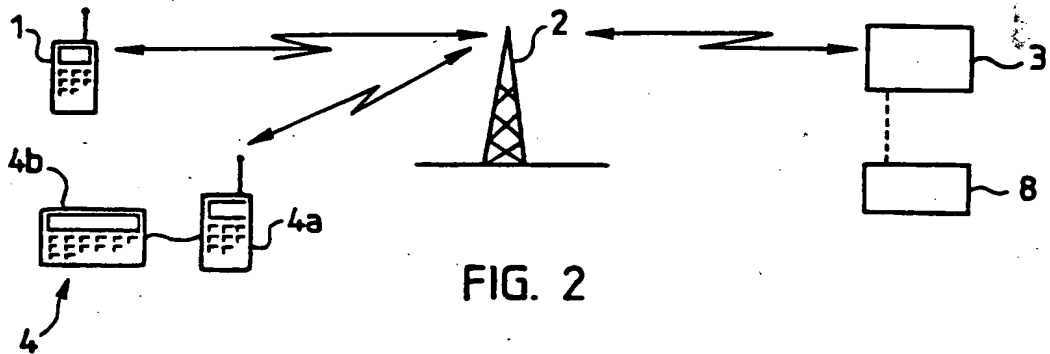


FIG. 2

9	10	11	12
ABC	ZAK-253	20:05	XYZ

FIG. 4

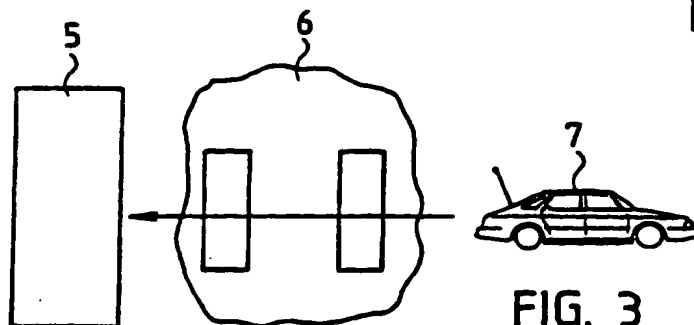


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 95/00554

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: G07C 1/30

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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IPC6: G07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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WPI, CLAIMS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9320539 A1 (TOMMY JONSSON), 14 October 1993 (14.10.93), page 4, line 6 - page 5, line 9, figure 1, abstract --	1-13
A	US 4555618 A (B.N. RISKIN), 26 November 1985 (26.11.85), column 7, line 5 - line 33, figure 2 --	1-13
A	EP 0006079 A2 (K.B. TREHN ET AL.), 12 December 1979 (12.12.79), figure 1, abstract --	1-13
A	WO 8401073 A1 (K. KATZEFF), 15 March 1984 (15.03.84), figure 1, abstract --	1-13

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Date of the actual completion of the international search

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Date of mailing of the international search report

30 -01- 1996

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INTERNATIONAL SEARCH REPORT
Information on patent family members

05/01/96

International application No.

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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO-A1-	9320539	14/10/93	NONE		
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			SE-B,C-	411600	14/01/80
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